



An informed approach to the rapidly evolving digital healthcare supply chain landscape

Experience and support

Technology is evolving at an unprecedented pace today, and healthcare supply chains – supporting both acute and non-acute care facilities – are increasingly dependent on digital solutions to support daily operations. This rapidly changing landscape demands critical and intentional examination of emerging technologies to confidently invest in your organization’s future, and ultimately, patient outcomes.

The KPMG team’s unparalleled experience in supporting healthcare supply chains in their transition to cloud-based operations – over 30 transformation journeys completed in the last 5 years – awards a distinct vantage point on the current and future state of technology in the industry. Our depth of experience provides an understanding of the nuances and trends within healthcare ‘digital’ supply chains. Across our engagements, focus is trending toward increased connected insights, predictive analytics, and a more customer-centric focused service delivery model. Assessing your organization’s digital technology stack for the appropriate advancements will enable addressing these trending themes, as desired.

In this report, we build on our experience to provide an overview of technologies we have encountered and evaluate their maturity in the marketplace. KPMG understands which solutions will help accelerate your supply chain and how to implement and leverage them effectively. For purposes of this report, we identify three phases of maturity into which supply chain technology solutions may fall:

Maturity Phase	Definition
Sunsetting 	Formerly common solutions that demonstrate clear functionality limitations relative to other technologies and healthcare supply chains’ evolving needs; clear replacements are emerging in the market.
Stable 	Common solutions seen in the market that meet most or all of healthcare supply chain’s baseline functionality requirements. While they may face competition from emerging technologies, they remain reliable and stable solutions.
Evolving & Emerging 	Developing and innovative technologies that are forward-thinking and flexible, allowing healthcare supply chains to adapt to the realities of our digital world and stay ahead of the curve.

Understanding where various technology solutions fall across this maturity spectrum is essential in planning for the technological advancements that will appropriately position your organization for success in a rapidly evolving industry.

Sunsetting

Paper Requisitioning/Purchasing

As more healthcare organizations transition to cloud-based ERP solutions, paperless requests and purchases have become a pivotal part of this journey. Organizations are motivated to entirely replace paper requests with trackable and automated digital and/or cloud-based solutions, allowing extractable and meaningful data-driven insights.

Manual Inventory Management

Manual methods of tracking and managing inventory are being replaced by more agile solutions. Recording inventory transactions on paper is labor intensive and exposes an organization to the risk of inaccurate data, resulting in erroneous reporting and the inability to glean meaningful insights to drive operational improvements. Manual inventory management is becoming a largely obsolete practice, replaced with inventory platforms storing and recording perpetual inventory levels.

On-Premises Enterprise Resource Planning (ERP) Systems

On-premises ERP systems are being rapidly replaced with cloud-based alternatives. On-premises solutions run on local servers, limiting the ability to integrate with other technology solutions and support a mobile supply chain workforce. On-premises systems tie up healthcare IT resources, hindering their ability to support business needs, including supply chain, to run and scale operations efficiently. By adopting cloud-based ERP solutions, healthcare IT resources are freed up to focus on more strategic initiatives instead of operational hang-ups.

Manual Sourcing and Contracting Processes

Processes relying on manual administrative labor are not customizable, repeatable, and have limited integration functionality. As healthcare organizations increasingly look to their supply chains to cut costs through strategic sourcing, manual contracting can both slow this process down and limit the ability to exhaustively and precisely survey sourcing options. Bringing key elements of sourcing and contracting such as RFx documents and supplier evaluations into online platforms drives a more automated and efficient process.

Stable



Cloud ERP Systems

Healthcare organizations are transitioning to cloud-based ERP systems at a rapid pace: Over a third of all healthcare organizations have done so to date. Gartner predicts that adoption of industry cloud platforms will grow from 15% in 2023 to more than 50% in 2027 (Source: Gartner, Top Strategic Technology Trends 2024, 2023.).

Combining the sprawling and intertwined needs of the healthcare organization's supply chain, financial, research and human capital management functions into a single platform solution not only streamlines operations, but also positions the organization for future growth. A single platform leads to integrated operations and more seamless data, allowing for more insightful analytics and informed decisions around organizational improvement. A cloud-based ERP platform offers what on-premises solutions cannot: a foundation for sound decision-making and maximal usage of other technologies through integrations.

eProcurement Platforms

Electronic-based purchasing platforms allow for a more streamlined and cost-effective procurement process than traditional procurement methods. eProcurement allows suppliers and purchasers to communicate easily, broadens access to a wider market of suppliers, and increases overall efficiency of the procurement process.

Radio Frequency Identification (RFID)

Radio frequency has been a stable choice for tracking inventory items in real time, allowing for a largely automatic replenishment process. RFID allows supply chains to track the movement of inventory out of both storage facilities and par locations, leading to improved operational efficiency and transparency throughout the supply chain. On the other hand, RFID requires a strong Wi-Fi signal, and many facilities contain Wi-Fi "blackout zones" in which the connection is weak and/or unstable. RFID can also be less cost effective than some emerging alternatives; more advanced barcoding and scanning tools are emerging that address some of these drawbacks.

Supply Chain Analytics

While predictive analytics are sometimes seen as more innovative than traditional reporting and analytics in healthcare supply chain, the need for strong master data management and foundational data is here to stay. Analyzing large sets of operational and financial data to provide relevant insights to supply chain end users remains crucial to organizational success. As data continues to sprawl and novel ways of leveraging data emerge, basic supply chain analytics run through analytics services remain stable.

Stable



Warehouse Management Systems

Warehouse Management Systems (WMS) allow healthcare organizations to manage inventory levels, driving lower risks of stockouts, shipment tracking, and optimal use of warehouse space. WMS enables route and load optimization, minimizing travel time and reducing overall transportation costs. Technology-driven warehouse management solutions are widely used in the market addressing the needs of today's healthcare inventory management teams.

Weighted Bins

When it comes to par locations, minimizing the level of effort required to trigger replenishment can vastly increase operational efficiency. Existing solutions can track par inventory using weighted bins, triggering replenishment when the bin weight dips below a predetermined value calculated using the par item's unit weight. While the cost of rolling out weighted bins can be steep and newer technologies purport to further automate the par replenishment process, weighted bins have proven to be a stable solution—particularly for procedural areas.

Mobile Functionality

As hospital systems continue to grow, so does the need for mobile functionality on inventory teams. Together with cloud-based enterprise solutions, mobile functionality is among the most adopted by supply chains today (Source: Gartner, *Aligning Digital Business and the Digital Supply Chain, 2022.*). Inventory teams operate on the move, and technology solutions that support their required mobility drive greater efficiency. Inventory teams are shifting away from desktop computers and stationary workstations to handheld devices at the site of their work in real time. Furthermore, the ability to scan labels for items and locations—both at inventory sites and par locations—using handheld devices drives greater efficiency in the inventory counting and put-away process.

Evolving & Emerging

AI and Machine Learning Tools

Automated Intelligence (AI) has the power to comb through large, complex sets of data to drive more informed decisions. Building on traditional data analytics, AI, and machine learning leverage predictive analytics, allowing organizations to predict inventory needs and automate reordering processes, among many other advantages. As supply chains become increasingly digitized, the volume of data available to organizations borders on unmanageable at times. Advanced automation of healthcare supply chain technology uses machine-learning models and predictive analytics to forecast demand and shortages well in advance with over 90 percent accuracy, according to Premier (Source: Premier, Preparing for the Unexpected: Disaster and Disruption Management in the Healthcare Supply Chain, 2023.).

Data as a Service (DaaS)

As the volume of available data grows, Data-as-a-Service vendors can help healthcare supply chains manage and leverage vast amounts of data. DaaS can increase availability of data to end users, empowering teams with actionable information. For example, DaaS can be leveraged to build virtual item masters (VIM) or product information management (PIM), creating a repository of product data with images, descriptions, attributes, and pricing information.

Robotic Process Automation (RPA)

Robotic Process Automation has been established in the supply chain space for some time, but only recently has emerged as an immediate must-have in healthcare. RPA can increase supply chain operational efficiency without sacrificing quality. Top-performing hospital supply chains are focusing on automating processes like analysis of vendor documents, invoice match exception reconciliation, back-order management, and more. We have seen recent success with clients enabling automatic requisitioning when par counts reach the reorder point. The automation of such tasks has significant savings potential for organizations while improving the accuracy of documentation.

Robotics

The use of robots and robotics is continuously expanding, from automated inventory management processes to the autonomous delivery of medical supplies. Commonly used within warehouse management systems, mechanical robots can navigate shelves, picking and placing items. This reduces manual labor and drives accurate and timely supply chain operations. Robots equipped with scanning and RFID technologies can help track and manage inventory in healthcare facilities. While still in early stages of development, drones are being explored for the delivery of medical supplies in remote and hard-to-reach areas.

Evolving & Emerging

Computer Vision

Computer visioning systems rely on artificial intelligence and image processing to analyze and interpret visual data captured by cameras or other imaging devices. In the context of healthcare supply chains, computer vision can be leveraged for quality control – inspecting the integrity of supplies by checking for packaging defects, verifying label information, and identifying any contamination or damage. Computer vision systems can also monitor shelves in warehouses or healthcare facilities to track stock levels, identify out-of-stock items, detect shelf expiry dates, and assist in replenishment processes.

Cloud-Based Item Tracking

While RFID remains stable in healthcare inventory management, more advanced item tracking is beginning to emerge. Cloud-based tracking that relies on small electronic tags can monitor an item's temperature, humidity, and other traits relevant to proper item storage. When these digital tags pass through reader gateways, their data and exact location gets uploaded to the cloud server (Source: KPMG International, The Future of Supply Chain, September 2023). This ability to not only pinpoint an item's location during its journey through an organization, but also to capture information about its storage traits, provides an exciting opportunity for inventory management.

Digital Twin

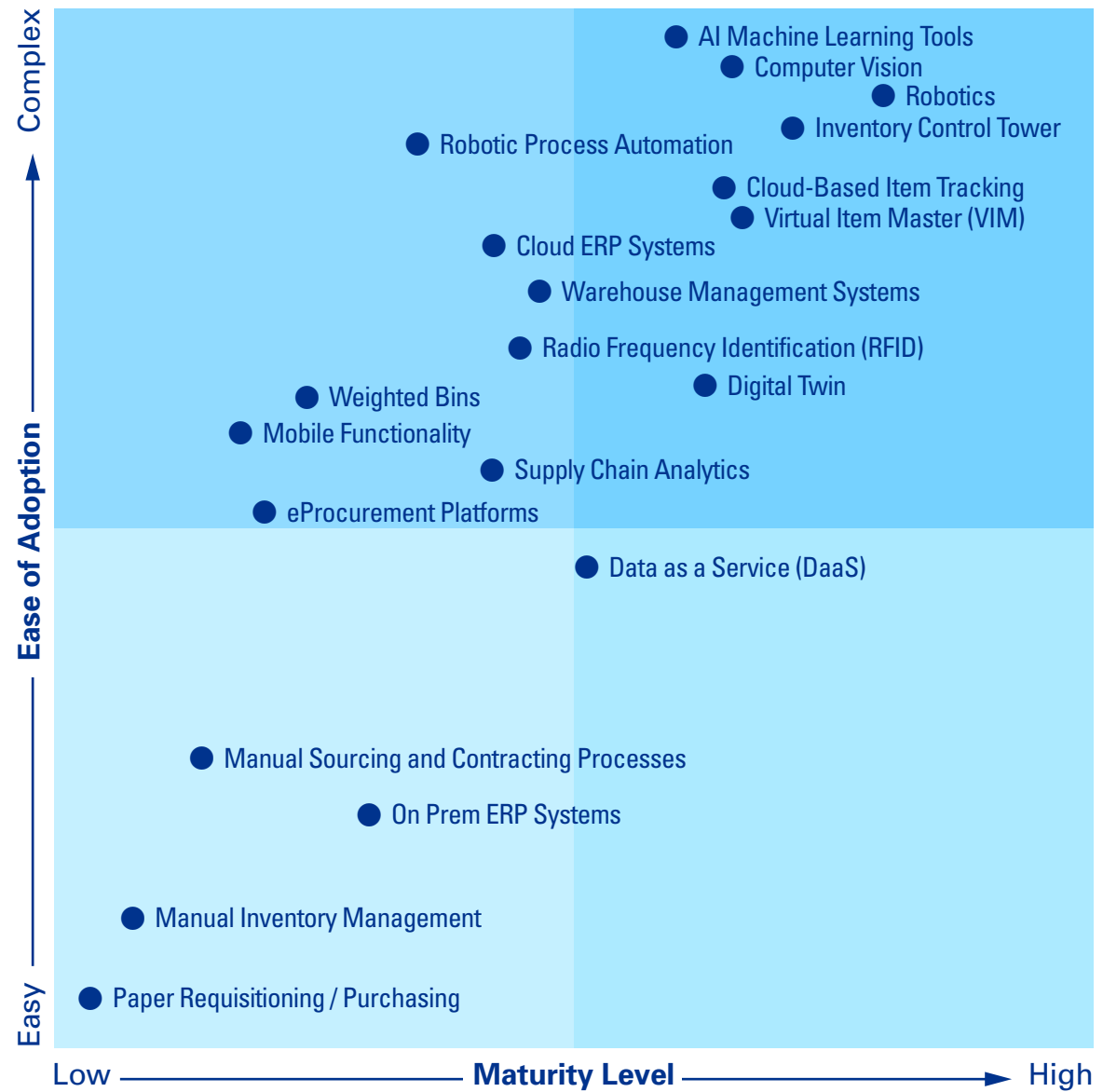
Digital twinning allows supply chain teams to experiment with new process flows in a virtual environment. Organizations can leverage virtual

replicas of their supply chain to identify bottlenecks in their existing processes and test scenarios that could drive greater efficiencies, such as new layouts for an inventory location or methods of tracking inventory. 33% of healthcare companies already use metaverse and/or digital twin tech to improve patient care (Source: KPMG International, The Future of Supply Chain, September 2023). While this includes functionalities beyond supply chain, the rapid maturing of metaverse technology is opening more opportunities to leverage digital twinning. In the context of healthcare supply chains, digital twinning can drive innovative solutions through virtual modeling of warehouse layouts and simulations of key inventory processes.

Inventory Control Tower

Healthcare organizations are increasingly focused on Third Party Risk Management (TPRM), which refers to the strategies around identifying, assessing, and mitigating risks associated with third-party suppliers to a hospital's supply chain. To mitigate the risks of supply shortages or disruptions, organizations are developing Inventory Control Towers – a centralized platform providing real-time visibility into an organization's inventory, inclusive of third-party supplier information. The Inventory Control Tower functions as a command center by monitoring the availability of materials across the supply chain network. This centralized, real-time view of supply information allows healthcare organizations to take proactive actions such as re-routing orders to an alternate supplier or swapping disrupted product orders with an available and approved substitute option, ultimately improving the resiliency of the hospitals supply chain and the ability to provide seamless patient care.

The Evolving Digital Healthcare Supply Chain Landscape



Conclusion

Understanding the supply chain technology landscape and leveraging a mix of stable, evolving, and emerging solutions can position organizations to capitalize on a host of advantages when it comes to procurement and materials management, including:

Cost efficiency: Greater cost efficiencies through labor automation are challenging traditional service delivery and offshoring assumptions; technology allows hospitals to increase security, controls, and governance with no corresponding work increase.

Productivity/Performance: Hospital supply chains have traditionally required around the clock manual labor, with technological advancements they are able to automate and digitize the execution of processes, 24/7 hours a day.

Consistency/Predictability: Enhanced processing capabilities increase data accessibility and visibility, enabling a new level of analytical precision; Leverage digitized process data to increase visibility and continuous process improvement.

Quality/Reliability: Exceptional procurement operational efficiencies; automatic information processing of textual data previously performed by humans; expected reduction in mistakes, accidents, regulatory violations, fraud, and increased controls capability.

Resiliency: Stable and emerging technological advancements support hospitals' ability to manage supply chain resiliency, minimize disruptions, ensure the availability of critical supplies.

Employee Satisfaction & Innovation: Eliminating mundane and repetitive tasks frees up human talent to innovate and create; Shift of talent skillsets to decision support; automation of complex processes will enable procurement to focus on insight delivery.

This report is intended to support planning and decision making around technologies to sunset, technologies to continue to support, and technologies to consider adopting for your healthcare supply chain team. Making the appropriate and intentional technological investment is critical to the efficiency of your supply chain teams' performance. Healthcare supply chain teams should consider the dynamics of the ever-changing technological landscape and rely on trusted data and expertise while undergoing supply chain transformation. KPMG is positioned to help guide organizations through vendor selection and implementation, including exploring integration capabilities, implementing change management, and supporting long-term adoption of new practices.

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